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EDITORIAL

"Who are the Authorities Fooling on Amateur TV?"

Over nine years ago the Wireless Institute of Australia, through its Federal Executive, made its initial application to the Postmaster-General's Department for the introduction of licenses for the Australian Amateur Service to participate in experi-mental Television (A5) transmissions. Since that date exactly thrty-five letters appropos of this matter have passed between the W.I.A. and var-ious Authorities and still there are no Amateur Television licenses.

Why such a license could not have been introduced under Section 103 of the Australian Broadcasting Act at that time when frequencies were being released by the Armed Forces and the respective bands reallocated to the Amateur Service is a mystery. But the then Parliamentary Standing Committee on Broadcasting (later re-placed by the Australian Broadcast-ing Control Board) and the Post-master-General's Department, Wire-less Branch, both in vacillating mood, informed the Institute ". . . that the The matter is still receiving con-

sideration in 1955! In 1949 the then Postmaster-General, Senator D. Cameron, said, "... that the Government is awaiting reports from the Post Office and the Australian Broadcasting Control Board before reaching a decision concerning the introduction of a Television system in accordance with standards best suited to Australian conditions . . ." and went on to say "Until the Government policy has been determined, the matter of granting permits for aerially radiated Television or experimental Television transmissions will be deferred . .

Despite the Institute's pleas that this concerned Commercial Television Services and should not debar the Amateur Service from its purely ex-perimental approach to this field, no licenses were forthcoming. Today the country is faced with an accute short-age of technicians to conduct the imminent Television Services, yet the Postmaster-General's Department and the Australian Broadcasting Control Board did not appreciate that fact when the Institute told them years ago that the introduction of Amateur Television licenses would provide a ready pool of men with valuable experimental and theoretical knowledge of Television.

And so the unhappy story goes on! Year after year the Institute advanc-ed reasons for the introduction of licenses, only to be put off by officialdom with one excuse after another, but always ending with ". . . the Institute's request will receive con-

In 1950 the Australian Broadcasting Control Board said that "... when the Australian Broadcasting Act is being amended to give effect to the recent decision of the Government in respect to Television, the views of your Institute will receive careful consideration . . ." Later the Institute
was informed that the introduction of Television had nothing to do with the Australian Broadcasting Act but came under the Television Act. Perusal of this indicated nothing relating to Amateur Television—only Commercial Television.

Then came more negotiations and correspondence; the Institute was notified that a Royal Commission on Television would be held, after which the Government would determine its policy! And so the Institute repre-sented itself before the Royal Commission and was promptly told that the matter it desired to discuss "did not come within the terms of reference of the Commission . . ." The Royal Commission tabled its findings before the Government, the Govern-ment decided its policy, licenses have now been issued to the Commercial and Government networks and the stage is set for the introduction of Television Services next year. And what of the Amateur? Exactly the same as pertained in 1949! Post-master-General, Hon. H. L. Anthony, M.H.R., is at present discussing the matter—for the third time—with the Director-General of Posts and Director-General of Posts and Telegraphs. He has said that "cer-tain investigations" have been made but it is necessary to make further investigations, after which the In-stitute can expect a reply to its

Who is fooling who? Why can't the Amateur of Australia experiment with Television (A5) transmissions as all other large Amateur-populated countries have permitted their Amateurs to do for years past? What is the real reason behind all these years of "begging the issue"? Can we now say that the introduction of Amateur Television licenses is imminent? FEDERAL EXECUTIVE.

representations.

EDITOR.

T. D. HOGAN, VK3HX.

MANAGING EDITOR: J. G. MARSLAND, VK3NY.

TECHNICAL EDITOR:

K. E. PINCOTT, VK3AFJ. TECHNICAL STAFF:

J. C. DUNCAN, VK3VZ. D. A. NORMAN, VK3UC.

COMPILATION: R. W. HIGGINBOTHAM, VK3RN.

CIRCULATION:

I. K. SEWELL, VK3IK. ADVERTISING REPRESENTATIVE:

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WHO WILL BE ON THE AIR WHEN TV AND TVI IS ON?

BY H. F. RUCKERT, VK2AOU

WHAT TV MEANS TO THE RADIO AMATEUR

T.v. means not only a new and modern method of entertainment or application of electronics for us in this country, but also problems to over-come. Those of us who have read "QST" or other foreign Short Wave Amateur magazines during the past ten years may know that t.v. has been the greatest and most dangerous threat to Amateur Radio the OM ever had to face. The one-eved monster in the lounge room of our neighbour and in our own house will force us off the air as long as our transmission is causing interference to the t.v. reception-we can be absolutely sure about this fact Our spare time entertainment and private studies, sometimes called hobby, are a matter of modern technique

The t.v.i. problem is a technical one and therefore we Amateurs should be able to solve it using modern electronic methods. We would soon loose every right, privilege and chance to continue as Radio Amateurs if we put the head into the sand. If we go into retreat, not transmitting when t.v. programmes are on, we soon will see that the t.v. show is always on the air when we have time for QSOs or the DX is coming through.

Other frequency hungry institutions are only waiting for this to happen, hoping we are not keen enough to improve our transmitters and to fight for what generations of Amateurs preserved or gained for us. Some people may hope that we might prefer the lazy way of sitting in front of the t.v. set watching the advertisements, not having the tackling modern electronic problems.

We have already been accused of not using the short wave bands to such a degree that these bands cannot be resame official voices have apparently forgotten to say also that commercial stations have not been using the higher frequency bands because even their kw's. and big aerials need sun activity to get to the other side of occans. But this shows only that any weapon may be used one day to silence Amateurs, and t.v. and t.v., will hit us hard. It most definitely will silence all those transmitters which are not up to the t.v.-age-standard as far as circuitry and construction is concerned.

To save Amateur Radio in this country it is of national importance to be able to offer the government our services as emergency or civil defence operators, as trained self educated radio operators and as experienced radio technicians the electronic industry can use without having to pay for our training or home studies.

It will not be easy for them to find the technicians to install and service the t.v. sets they will sell. Many Am-ateurs with their experience will be * 25 Berrille Road, Beverly Hills, N.S.W.

engaged soon in this field so we should co-operate with our greatest counter-part! Actually we only have to build and operate our radio station up to modern standards, which is not too much nodern standards, which is not confucin to ask. We should have done this much earlier anyhow, shouldn't we? The P.M.G's. Department, which is judging our work, would appreciate this.

It is time to start now, before DX gets better, so making it heart-breaking to pull the old tx to pieces. Having done this, we will see that t.v. is not a haz-ard to Amateur Radio, but it will be very beneficial for us. There will be less interference on our receivers

Neither the Government nor electrical appliance manufacturers have been very concerned about the interference we have on short waves from motor car ignition, from fluorescent lights, trams, from dozens of automatic switches and temperature control systems, from faulty power lines and insulators, and many other man-made sparks, not forgetting the lawn mowers, drills and saws in back yards and workshops. Of cause there will be a tough law to protect the t.v. set owner soon because t.v. advertising is a big business affair unlike Amateur Radio.

Will the electronic industry and the

retailers co-operate with us as is the practice in U.S.A. where they install a filter in the t.v. set in those cases where the fundamental of an Amateur transmitter is blocking the t.v. mixer due to bad t.v. set design and insufficient front-end selectivity? It is not the job of the Amateur to re-build or improve the t.v. set, he has enough to do with his own gear.

The Amateur on the other hand should not think that the efforts of the President of his W.I.A. Division, the Council, or the T.v.i.-B.c.i. Committee of his town can do the job alone. We also should not rely on t.v.i. filters we may try when we are getting into trouble. It is still the individual Amateur who has to do the job of modernising his transmitter. The T.v.i. Com-mittee may advise if the standard methods we describe now have failed.

CHECKING HARMONIC RADIATION FROM AMATEUR TRANSMITTERS Many with receivers able to receive

on frequencies where they may radiate harmonics, will get a big surprise if they try it out. It is correct that there was not much DX on Amateur bands higher than 14 Mc. in recent years, but it is unfortunately wrong that no Amateur signals have been on 21, 28, 42 Mc. and higher harmonics.

If you hear a strong local station on If you near a strong local station on 14 Mc. with \$9 plus signal, make it a habit to tune for his harmonics and send him a QSL. At first he may be embarrassed, and send you no too, but you both should be grateful for the information. It is much better a fellow Amateur makes you wake up than the Wireless Inspector with the patrol car at your front gate, or a neighbour

at your front gate, or a neighbour mocking at your door. You may prefer a feet of the property of the property

harmonics on 6 and 2 mx for so long. He has the receiver you may not have. You will hear stations half to two miles away which still have an S9 plus 30 db. signal on 28 and 42 Mc., the second and third harmonic of their 1 Mc. transmission. There is no doubt that they will put a very nice signal in on many t.v. channels. They may not believe this until you can demonstrate this

A very extraordinary case was a VK2 station working on 7.1 Mc. whose second harmonic was S6 on 14.2 Mc. at ten miles distance. The fundamental signal was only 100 times stronger. It is eviwas only 100 times stronger. It is evident that such a station is wasting a lot of the precious 100 watts he can use. We actually could make use of this position because there is often bad local QRM on 7 Mc. during the VKEWI broadcast from lawn mowers, whilst we may receive a strong and clean signal on a harmonic.

on a narmonic.

Let's all go v.h.f. and chase our harmonics! You will be shocked how few stations are OK and fit for the t.v.i. battle. As many as possible must be ready before the first t.v. transmitter gets on the air, so we can't be blamed for all the t.v. reception trouble and it will not be forgotten that we are still interested in all our Amateur band frequencies.

SIGNAL AND NOISE LEVEL

It is usually agreed upon that the noise level in a densely populated com-munity will not be less than 10 microvolts. We can only expect a good t.v. picture if the picture signal is 100 times stronger than the local noise level, that is 1 millivolt. For satisfactory sound reception, the ratio could be smaller

(10:1).

If we are at a location where all t.v. transmitters are delivering a stronger signal to the t.v. receiver aerial we may be allowed to generate stronger harmonics than 10 microvolts, which is about a S6 signal.

We will use for our following discussion the values published in the A.R.R.L. Handbook, or as they are used by the Handbook, or as they are used by the well known Collins Radio Co. for S meter calibrations. S9 is equal to 100 microvolts at the 70 ohm terminated signal generator cable. 6 db. or a voltage ratio of 1:2 is used to get the smaller S unit values. It may be mentioned that 20 db. is equal to a 1:10 voltage ratio.

TESTS IN THE BACK YARD

We should find out how much trouble we cause to our neighbours and viceversa if we do not already know about the b.c.l. Set up a short wave receiver in the back yard about 60 feet away from the shack and connect the receiver to the lawn mower cable if you don't

have a battery operated set.

The first surprise will be that you can hear quite well the harmonies the oscillator of our neighbour's radio set is radiating if you move with the test aerial close to his house. This proves that his receiver causes most of the b.c., were our harmonic radiation free transeven our harmonic radiation free trans-

mitter will get blamed for.

What about the radiation of his v.h.f.
oscillator and the electronic high tension power supply his t.v. set will
produce? You will need this test to
defend you later.

The next discovery will be that you can hear at \$3 to \$4 the second harchest and by passing. The frequency meter you used entision could be so strong that this may cause tv.l. too. Disconnecting the entision could be so strong that this may cause tv.l. too. Disconnecting the major that the second hard the hard the

NOW LET US TEST OUR TRANSMITTER

Connect a shielded dummy load to the antenna terminals. A 75 watt globe should be enough if you use 100 wast the should be enough if you use 100 wast the should be enough if you use 100 wast to the should be should be enough if you should not hear much the she's yard you should not hear much castlators or frequency meter. Now connect or plug in the isolator stage valves or frequency multiplier stages will be should be shou

If now the switched on final makes it much worse, then you know that a low-pass antenna filter will not help you and a mains line filter will be just as usebs because your transmitter chassis is still r.f.-hot, making shielding uneffective, even if you don't burn your hands when you touch it.

The next test series can be made with the transmitter at full power, modulated by a watch, and any serial available the value of value of

how much energy is wasted and scattered. You may be surprised how look the average modulation percentage is if you work without splatter on peaks with 6-8 Kc. bandwidth, unless you use a clipper filter arrangement.

Now tune to harmonics at 28, 42 Mc. and higher if you are lucky enough to have a receiver which does so. If your Smeter still reads a signal on harmonics or if you can copy these without using or if you can copy these without using the young they you will not you w

Without mains line and antenna filters you can get a ratio of harmonics to fundamental voltage of 1:100,000 (S1) and a schieved can you hope that a mains line filter and a good antenna low-pass achieved can you hope that a mains line filter and a good antenna low-pass the property of the same operation of t



ANTENNAE AND TVI

You will soon see, making these tests, that flat line feeders radiate far less that flat line feeders radiate far less and mains cubies than single wire feeders. Far better again is co-ax cable. Quite successful was a piece of and outside 70 ohm twin lead cable, if you can't afford 60 ft. of co-ax or so for the whole feeder. The awn. re-for the whole feeder. The awn. re-feed improvement as far as harmonic radiation was concerned.

Antennae which are tuned and matched to a certain band will help reduce harmonics which may still get out from the final. The length and type of earth cable connected to the transmitter chassis also makes quite a big difference. At est may show the best connect it.

CHASING HARMONICS AROUND THE PLACE

The tests in the back yard have shown which stages generate too much harmonic energy. Most helpful is a g.d. meter to chase components and leads which may be tuned to the discovered harmonic without being determined to act as tuned circuits for the particular frequency. You can make amazing discoveries in this way, and some cases reported in "QST" are almost fantastic. Even more helpful in tracing insuffic-

Even more helpful in tracing insufficient shielding, wrong by-passing and wrongly placed chassis connections is a small r.f. indicator (sonde) made with a 50 microamp, meter, a G.E. diode and a few other components.

a few other components.

With the transmitter on, walking with
the sonde through the shack and house,
touching any metallic objects with the
sonde, you will be amazed to learn
where the energy from your transmitter goes. You soon realise why
others get that rare DX station you call
because your transmitter is warming up
the kitchen sink as well as the gas stove.

the kitchen sink as well as the gas stove. The mains connections direct at the The mains connections direct at the be different at a point three wave lengths away where your neighbour converges of the property of the prope

What if your transmitter is finally free of harmonic radiation, but a gutter and down pipe, the steel kitchen sink and the steel kitchen sink and the steel kitchen sink and copper pipe, installations with a steel control of the steel contro

LOOKING INTO THE TRANSMITTER

In a different chassis we find r.f. on the panel and shielding plates which should divide the chassis into different compartments. Covering the compartments with aluminium sheet or copper fly screen with enemants in this case, fly screen with enemants in this case, boxes, i.e. not closed on the top, act as a secondary coll winding. Wire mesh is quite effective if connections are made every two, inches to the chassis.

Slots or bad contacts along shields are also detected by the sonde. There may still be rf. around a knob with which we operate the coupling capacitor which is in series with the link coupling coil coming from the co-ax output of the pi filter. Rf. is radiated from here by-

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passing any low-pass filter in the aerial. The chassis is hot, not permitting effective shielding for a mains line filter, and r.f. is therefore by-passing this filter, too. shows immediately the trouble-causing component. This coupling capacitor has not insulated from the capacitor but only from the chassis. The short piece of the 4" spindle goes insulated through a i" hole in the panel. This spindle acts like an aerial around which we place a wire ring. Both parts form an r.f. transformer. It was very easy to mount the capacitor 2" further back and put a short piece of insulating material

through the front panel. After the author had fixed the abovementioned design errors the reduction of harmonic radiation was 100 times better as a further test in the back yard

EFFECTIVE BY-PASSING

showed

The old school of thought was that the bigger the by-pass capacitor the better. A good lesson was the descrip-tion of tests in "QST" and similar but more extensive measurements have been carried out by VK2AZB and the author.

Talking about short waves and t.v. frequencies we can say that the most effective by-passing is achieved if we tune the by-passing is achieved it we tune the by-pass capacitor with attach-ed leads to the frequency we wish to by-pass. It is useless to take a bigger capacity value with lead lengths which will resonate at a much lower frequency than we wish to by-pass, because the effective capacity is reduced by the inductance of the capacitor leads and the self inductance of the capacitor.
These inductances make the capacitor act like a choke causing so much more than the operating frequency the by-pass capacitor has a good chance of being most effective at or near an undesired harmonic and it will act as a capacitor for all lower frequencies.

The A.R.R.L. found the following t.v. harmonic trap most effective. Parallel to a bunch of pi filter output capacitors of 500-1500 pF. was a small capacitor and one lead was wound into a small coil tuned to a v.h.f. frequency. Also parallel to this series resonance wave

trap was the antenna feeder co-ax cable. Soldering our by-pass capacitors parallel to a piece of copper of a few square inches we can easily find the resonance frequencies with the grid dip resonance irequencies with the grid of meter. Using for example a ceramic HK disc type capacitor which can have for similar capacity values different types of dielectrics, depending on the chemical composition of the material, we can give this series tuned circuit just enough power factor to be broad enough tuned to cover one or the other Amateur bands. Mica or low loss capacitors are not so suitable in this particular case, not so suitable in this particular case, whilst paper capacitors have too high a power factor. A 4" diameter ceramic may do the by-pass job much better than the old 0.1 uF. paper tubular condenser with its 1 Mc. self resonance frequency, and even a 0.01 uF. ceramic disc with the resonance frequency of 20 to 8 Mc. may be the wrong thing. If you can't avoid long leads, use copper foil half an inch wide. The same

applies to by-pass capacitors which have a twice higher self resonance frequency if you replace the two 4" long wire leads by 4" wide copper foil strips.

The g.d. meter shows you where you The g.d. meter shows you where you are with your by-pass capacitors, and the sonde will tell you how effective they are. A $\frac{1}{2}$ " of wire is equal to 10 cm. inductivity or 0.010 uH. inductance.

A TRANSMITTER CIRCUIT OF LOW HARMONIC GENERATION

Having followed the description of tests so far it is easy to understand that we should start with a circuit which is unlikely to run into much trouble at all. The remaining radiation of harmonics may then be very much easier to cure or to confine to transmitter stages where they can't do much harm. · Don't operate oscillator or frequency multiplier stages with more than 2-3 watts input, to keep the energy of gen-erated harmonics as low as possible.

- Omit capacitive coupling between the stages, because that is the way harmonics escape. · Use band-filters in between the fre-
- quency multiplier stages and inductive coupling with link and co-ax cable to the driver stage. · Use a well screened pentode as driver
- stage, with good shielding between input and output circuit.
- · Never use the driver or final stage as frequency multiplier, they should act as harmonic filter stages.
- · Use pi tank circuits because they provide a by-passing of harmonics with the filter output capacitor being parallel to the co-ax which leads to the low-pass filter
- · The low power frequency multipliers make it a must to use modern tetrodes or pentodes for the driver and final. Their internal shielding is very helpful in isolating the transmitter from the aerial as far as undesired frequencies are concerned. Also neutralisation may then not be necessary
- Use an antenna coupler following the tank and low-pass filter with inductive
- coupling. Cover the instrument holes in the chassis with tins (surplus from the XYL's kitchen) for screening.
- Use only co-ax cable and shielded hook-up wire for all wiring in the transmitter (at least in stages and chassis where r.f. or a.f. may be). It saves you the time-consuming tracing of r.f. in modulators and power supplies later.
- · Use wire mesh for the back of the transmitter to get the required shielding and necessary ventilation.
- Use band switching throughout so that you don't have to unscrew the shielding to change coils, etc.
- It is advisable to use shielded cables for the key, mike, monitor, etc., and co-ax feed-through capacitors are often the only way to get effective by-passing.

You will find in "QST" and Phil. Rand's publication further important information about sources of t.vi. and methods of curing it. The A.R.R.L., the T.v.i. Committees, especially in Dallas, Texas, and many single Amateurs did a

Frequency Channels for Television Stations

The Postmaster-General (Hon. H. L. Anthony, M.P.) recently announced that the Australian Broadcasting Con-trol Board had allocated frequency channels as indicated hereunder to the television stations which in accordance with the Government's approval, are to be established in Sydney and Melbourne:-

Channel No. 2, 63-70 Mc.: National television stations-Sydney and Mel-

Channel No. 7, 181-188 Mc.: Commercial television stations to be operated in Sydney by Amalgamated Television Services Pty. Ltd., and in Melbourne by a company to be formed by the Herald and Weekly Times Ltd. Channel No. 9, 195-202 Mc.: Commer-

television stations to be operated in Sydney by Television Corporation Ltd., and in Melbourne by General Television Corporation Pty. Ltd.

The Board has also determined that each of the stations will be authorised to use up to 100 kilowatts effective radiated power, that the Sydney trans-mitters should be located in the Gore Hill district, and the Melbourne transmitters on Mount Dandenong. ----

W.E.A. CERTIFICATE CANCELLED

The Radio Society of East Africa has announced that the issue of the Worked East Africa (W.E.A.) Certificate has been suspended indefinitely and further applications can be considered. Outstanding claims will be dealt with in due course. The Society hopes to issue a new certificate shortly.

very excellent job in demonstrating to the W Amateurs, industry and radio trade representatives how to t.v.i. proof transmitters—both home-built and com-mercial—putting 1,000's of Ws again back on the air.

"T.v.i. suppressed" is the most important sales feature the commercial built transmitter must have in U.S.A. now. Even the Halicrafters transmitters used for the Clipperton Island adventure had been t.v.i. suppressed.

This problem concerns also the v.h.f. Amateurs because they will not have, for very long, the chance to shift or escape to higher ground (frequencies). Colour t.v. will find us even at 290 Mc.

A further article will describe a transmitter with the above mentioned constructional features, a later still will describe the calculation and tuning of a low-pass filter.

REFERENCES

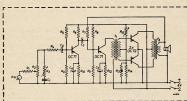
"By-passing for Harmonic Reduction" (Gran-physics) of Harmonic Reduction (Gran-"The Dallas Plan for TVI," "GST," June, 183. "Letters from the TV Receiver Manufacturers," "GST," March, 183. "TVI "GST," March, 183. "TVI "GST," June, 1833. "Harmonic Radiation from External Non-linear Systems," "GST," Junary, 1833.



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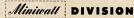
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7 Mc. MOBILE CONVERTER

BY R. S. FISHER,* VK3OM

WITH mobile operation becoming more popular on the lower frequency bands, the author feels that the description of a sensitive and stable converter for use on the 40 metre band will be of considerable interest.

As it is crystal controlled, it offers many advantages over the usual tuned type. Firstly, the stability is determined by the broadcast receiver with which it is used. Secondly, all tuning is done on the broadcast receiver dial. This means that the converter can be placed in any convenient position in the car, such as under the dash or in the glove

The converter uses a crystal at 6.2 megacycles. This means that the 40 metre band is covered by tuning the broadcast receiver from 800 to 950 Kc. broadcast receiver from 800 to 950 Kc. A crystal of another frequency can be used, providing the difference between it and the 7 megacycle band is within the tuning range of the broadcast receiver. The crystal used by the writer was obtained from a 5-7 megacycle Command transmitter. by one American commercially made converter. A tuned output was not considered necessary.

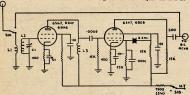
With the 7,500 ohm resistor in series with the high tension line, the current drain with a 200-250 volt supply will run about 10 milliamps., which should be well within the capabilities of any

standard car radio.

The converter should be built into a small metal box that will fit into the space available. It is most important that the whole thing is well shielded and all leads running to the converter (including the power leads) should be completely shielded.

The actual construction is left to the reader. The whole thing can be made quite small and a size of about 3 x 4 x 5 inches is suggested. The writer constructed his unit in a small disposals beacon receiver box, of about this size.

Initial lining up of the converter should be done on a receiver with an S meter. Firstly, peak C1 on a strong signal and then adjust L2 and L3 on



A glance at the circuit diagram will show that it is of straight-forward design. The aerial coil is wound on a sign. The aerial coil is wound on a meter. Li is ten turns, L2 is 40 turns. All coils are wound with 30 gauge cotton covered wire, close wound. The grid condenser CI, which has a maximum capacity of 30 pF., can be brought out to the front panel if need be, but this is not really necessary as the tuning will hold across the band.

The r.f. stage uses a 6SG7, 6SH7, or a 6BA6. Any of these tubes will work with equal results. The r.f. stage is coupled to the mixer via L3 which is also wound on a 38th inch slug-tuned former and consists of 45 turns. Make sure that the coil is well separated from the aerial coil.

The mixer uses a 6SA7 or a 6BE6. A hextode triode can be used with some slight modification to the circuit. The output of the mixer is resistance cap-acity coupled to the broadcast receiver via a short length of co-axial cable. This type of coupling is quite satisfactory in its operation and is, in fact, used * 81 Neerim Road, Caulfield, S.E.9. Vic.

a steady signal, or use a signal generator. The next step is to connect the converter to the receiver with which it will be used. Connect the antenna, peak the aerial trimmer C1 again and then peak the aerial trimmer of the broadcaster receiver and the job is done.

With regard to the antenna, various types of loaded whips used for trans-mitting may be used with excellent results, however the standard broadcast whip can be used providing it is at least four feet long. The writer uses his converter in this method and results have been more than satisfactory.

Ignition interference may cause a prospective builder some worry, how-ever in most cases it is very easy to clear up. Usually all that is needed is a suppressor in the lead from the coil to the distributor and perhaps a sup-pressor on each spark plug. If this does not bring it down to a low level, bond the bonnet and fire wall to the chassis, also a 0.5 uF. condenser from the battery terminal of coil to earth will help.

However, if any trouble is experienced in this matter the writer will be pleased to answer any queries.

A Circuit to Measure Capacity & Inductance BY N. R. DILLEY.*

The writer has enjoyed reading the issues of "Amateur Radio" that he has received in the States. It is apparent that the boys "down under" are having a lot of fun from their hobby

a lot of fun from their hobby.

In order to help round out the measurements side of Amateur Radio, the following circuit is submitted to the readers of "Amateur Radio."

Those Amateurs who have a supply of crystals and some standard conden-

sers can measure inductance with good accuracy with it. The circuit is shown in the following schematic.

The circuit is quiescent until the tank is tuned to the same frequency as the crystal when oscillation takes place. The grid current is adjusted for a maximum with the variable condenser (the range of which will determine the range of inductance that can be measured with one crystal). The inductance is found from the formula for the resonant frequency of a parallel tank circuit given the frequency and the capacity. A nomograph relating L, C and frequency will save computation.

For those Amateurs with surplus or able to get surplus gear, it will be stated that the GP-7 Aircraft Tuning Unit has that the GP-7 Aircraft Tuning Unit has a variable condenser in the range of 20-180 pF, that is quite linear. The dial divisions break down to about five divisions per l'pF, which is handy for reading. The TUSB Tuning Unit of the BC191 (B24 Liaison Transmitter) has several calibrated fixed condensers handy for calibration of another variable condenser.



Operation of the circuit is quite instructive and one can easily note how the capacity changes on the high side of resonance changes the frequency much faster than on the low side of resonance. The tank response can be noted for it is the tank Q which determines the oscillation range as the crystal Q is much greater. If two tube sockets are wired in the

set one can determine the tube inser-tion capacity by tuning to a peak of grid current with both tubes inserted and then withdrawing one. The amount of capacity that needs to be added will be the capacity associated with one tube and would need to be added to con-denser capacity for the true amount of

capacity 924 N. Riedel Ave., Fullerton, Calif., U.S.A.

Amateur Radio, September, 1955

Page 7

A Triple Conversion Amateur Band Receiver

BY DON B. KNOCK* (VK2NO), M.I.R.E. Aust.

was an article in England's "Short Wave Magazine," by G2IQ, in the issue for August, 1947, on "Amateur Receiver Design" that really started this thing off—this quest for appropriate selectivity, plus stability. appropriate selectivity, bits stability.

GZIQ's 110 Kc. i.f. assembly prompted a similar set-up, and this, with a 175 Kc. i.f. channel, was a revolation when used in this "built-up" Amateur area. receiver then constructed turned to be a massive affair, as ex-Navy out to be a massive shair, as ex-way
coil turrets—those 7 or 8 inch diameter
moulded bakelite affairs—were adapted
for use in the front end. The final creation was a rack and panel arrangement about as large as the wartime Kingsley AR7, complete with power supply and was a generously proportioned that structure.

The line-up was EF50 r.f. stage, ix./osc., 6U7G 1st i.f. at 1980 Kc., ECH35 crystal osc. at 2155 Kc. (a disposals crystal I had on hand), two 6U7G if. stages at 175 Kc., 6Q7G second de-tector with 1N34 noise limiter, 6V6G audio output and 6J5G beat oscillator. The voltage regulated power supply used a 5Y3G rectifier with VR150/30

regulator.

This receiver, in completed form, satisfied a need long in evidence; that of more than average selectivity for 14 Mc. phone operation in particular. Despite the inherent stability of the second fre-quency changer, which used a Pierce type crystal oscillator, an irritating fault showed up in the front end-one of drift and frequency change. It was attributed to a number of causes, including the use of a combined frequency changer valve in the signal input. With due attention in the signal input. With due attention to obvious engineering practice in receiver construction, these faults could have been hunted down. The use of a separate oscillator valve with appropriate zero and negative temperature capacitors would have done the trick.

By this time, however, the writer's liking for trying anything at least once had resulted in being attracted to the use of a crystal-locked signal input circuit in conjunction with a tunable i.f. channel. The much-vaunted Collins 75A kind of receiver indicated the commercial trend and the idea was uppermost that some day something of the kind might be tackled, a sort of Chinese copy! With the passage of time, and the in-evitable acquisition of war surplus gear,

came the urge to get on with the job.
A further fillip was provided by that A further fillip was provided by that excellent crystal converter article by W1DX in "QST" for December, 1948. With a lone but good 6J6 in the spare valve quota, plus a couple of 6AK5s, there seemed to be no further excuse for inaction

THE SET-UP

Conventional chassis construction was the initial plan, but a light, yet very strong frame from a BC375E transmitter swung the vote again in favour of rank and panel assembly. Moreover, that and panel assembly. Moreover, that frame only cost me 2/6 over a Sydney counter renowned for "lucky dip" bar-gains. So it was that the present triple * 43 Yanko Avenue, Waverley, N.S.W.

conversion receiver arrangement came into being, starting off some moons ago with a 14 Mc. crystal converter—an exact duplicate of the WIDX design. This, for the benefit of those who may not have seen it, uses a 6AK5 as a neutralised triode r.f. amplifier with a 6J6 crystal osc./tripler, a 6AK5 mixer, and 6C4 cathode coupling output valve. The latter was dispensed with as not being imperative and the injection frequency broad-banded out around 1900

The crystal used in the writer's converter is 5450 Kc. Hitched to an average receiver tuning between 2350 and 1950 Kc. for the requisite coverage of 400 Kc., the result was at once impressive. A

extra shielding seemed to have much effect, and the prospect of those intrud-ers in the middle of "twenty" was appalling. Reluctantly, that i.f. tuner was scrapped, although more patience might have decreed otherwise.

About this time, a Short Wave Listener friend came to light with a present in the form of one of those natty little American "Command" receivers—a CBY46104—normally of not much use to a VK, covering a non-Amateur part of the h.f's., 1.5 to 3 Mc.

Having acquired this 1.5-3 Mc. box of tricks, the thought immediately surged uppermost, what now of the 14 Mc. crystal converter? In order to put

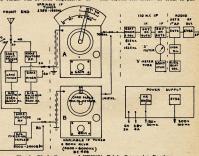


Fig. 1.—Block diagram of VK2NO's Triple Conversion Receiver. A.—Command Receiver Unit CBY46104 (1.5 to 3 Mc.) B.—Command Receiver Unit BC454 (3000 to 6000 Kc.)

few "joeys" occurred until the 6AK5 triode r.f. stage in the converter was tamed, but with that done, the spurious carriers vanished.

With the 14 Mc. converter tested and accepted as a worthy keystone to better things in receivers, a move was made in the matter of low frequency i.f. channel and input tunable over a range of 2 to 4 Mc. Simple enough? Yes, but with a penalty should shielding be only partial and not completely effective. The assembly was made up with a 65K7 r.f. stage ahead of a 65A7 mixer/osc., followed by two 6U7Gs at 110 Kc., 6Q7 detector, 8H6 noise limiter, 6V6G audio, and 6J5 beat oscillator. A reasonable amount of care was taken with the layout and the construction, but evidently not enough. Slap around 3 Mc. on the tuner dial appeared a cluster of strong unwanted oscillator sub-harmonics and hard-to-define beats. No amount of

this into action with the least toil, a 28 volt heater transformer was made up from an old power transformer as-sembly, a B supply hitched on, and the little receiver connected up to the crystal converter. Presto, a nice clear 400 Kc. for 20 metres; no joeys, just Amateur signals, and everything nice and stable in the c.w. world.

in the c.w. world.

In the c.w. world.

However an E. Chyédiot d'idn't help much, being at 705 Kc., so a simple way out was then tackled. The previously extrapped of the control of the c with 6U7Gs, 6Q7G second detector/a.v.c. with 1N34 series noise limiter, 6SN7

v.t.v.m. bridge type S meter and 6J5 beat oscillator. The result is just what the doctor ordered.

CONVERTERS

Little elaboration is needed on the construction of WIDX's converter. Sufficient to say that it is employed just feeled to say that it is employed just electronic to the construction of the converter was made up for do there converter was made up for do there converter was made up for do there converter was made up for do the converted was a peniede of 50 crystal oscillation of the converted was a peniede of the c

As the 4600 Ke. crystal provides the 150 Ke. in the (Australian) 40 metre band between 2000 and 2150 Ke., the advantage is that this is inside the Command unit tuning range already in use for 20 metres. It means that a simple modification to the dial gives a handsome amount of bandspread on 20 metres and plenty on 40 metres also, using the common seale and pointer.

COMMAND LF. TUNER DIAL MODIFICATION

By marking with a pencil on the black metal dial the limits of the 20 metre metal dial the limits of the 20 metre was a constant of the control of the contr

The effective spread on 20 metres is four inches, and on 40 metres, two inches. For illumination, two 12 volt lamps in series are fitted behind the scale.

Because av.c. is included in the 110 Ke. Lif channel, no alteration was made the following the control of the c

have here an ideal combination by using a converter for that band, employing a mover-crystal osc-tripler from the state of the state of

Simple switching and the grid and oscillator sections covering the requirements takes care of this. Standard broadcast coils, tapped for cathode coupling, are padded to hit 815 and 1526 Kc. respectively, with adequate shielding against direct pick-up from local broadcasters.

S METER

Any of the usual signal strength meter applications can be used, but the one favoured by the writer is that diagrammed here. It has the following advantages:—

- You don't have to break into the i.f. anode circuit to insert the meter.

 The sensitivity is adjustable to suit
- the particular receiver to which it is adapted.

 Once the bridge is balanced, the meter seldom needs to be reset for
- meter seldom needs to be reset for zero or calibration. A double triode valve is applied, and

A double triode valve is applied, and may be a 6SN7, 6SL7, 6C8G, 6F8G, or other suitable types.



Fig. 2.—S Meter (v.t.v.m.) for Triple Conversion Receiver.

Each triode functions as a leg in the bridge in conjunction with the 50,000 chm resistors. There is a 500 chm variable shunt resistor across the meter, which should be of 500 microamps or less. Balance for a zero reading is adjusted by the 5,000 chm potentiometer from cathodes to earth, and even with line voltage variation, there is rarely any need to reset this.

The grid of one triode section is earthed and the grid of the other connects to the a.v.c. line at a point where it is by-passed to earth by the a.v.c. filter condenser.

POWER SUPPLY

Power requirements call for a transremer giving h. 14 st 300 voits per side for the property of the procedure with 5 voit windings. If the procedure with the Command units is followed as in the giving 24 to 28 volts at 3 or 4 amperes will be needed. This might just as well will be procedured. This might just as well besters for 12 voit operation. You would still need a 12 voit thester as an voit valves for the 12 voit types fifted is not a particularly good one. Why discord perfectly good 12 voit valves for performance?

The high voltage output from the h.t. section of the power supply unit delivers the requisite 250 volts for audio and anode feed and another output, regulated at 150 volts, by way of a VR150/30, is provided for screen and oscillator voltages.

OPERATIONAL POINTS

There is little more to be said about the receiver except to praise its func-tional features, it really has an excellent performance. Note that a beat oscillator is included in the 110 Kc. i.f. assembly instead of relying on earlier heat oscillator injection as provided in the Com-mand units. It was found that the beat oscillator later in the circuit turned out to be a handy factor in the reception of single side band transmissions; it supplies the missing carrier just at an appropriate level, and with no measurable drift in the crystal-locked front a correction of a cycle or two is easily done by the adjustment of the 25 pF. midget variable condenser from the cathode tap on the beat oscillator grid coil to earth. The use of the beat oscillator sections in the Command units is ruled out for this purpose by the fact that where a small screwdriver adjustment hole at the side of the chassis is the modus operandi. It was not intended in these units that the beat note be touched once it is bench-adjusted

The Command units are not provided with a.v.c. as they stand, and reliance was placed entirely on the a.v.c. provided in the 110 Kc. if. unit. This turned out to be adequate for the purpose and the gain control on the Command tuners can be more or less premare the control of the command tuners can be more or less premared to the control of the contr

It is found that the Faraday shielded input to the r.f. stage in the converters on 20 and 40 metres is a real asset where a strong local station may be working in close proximity, physically and in frequency.

The band-pass provided by the two fit stages at 10 Ke, is an anrow as a first and the first and the first and the first and the first and first an

For c.w. operation the receiver is good enough to satisfy the most rabid DX contestant, with the knowledge that unless the station being received is at fault in that respect, signals don't drift even with varying line voltage. They stay put on the tuner dial. If one wishes

to go to the de luxe c.w. requirement, there is no need to include the complicated and not-altogether-satisfactory accessory of a crystal filter. Simplest way is to include an audio filter in the speaker (or headphone) leads. Heterofil and other more recent schemes are something really worth while, when used in a receiver of this kind.

There is a great deal more that could be written about this triple conversion receiver, but anything missing, such as a circuit of the converters, can be found in the pages of "QST" as quoted. The general idea can be followed readily from the information given. It is indeed a pleasure to use and after a few months of so doing, on 20 metres in particular, the writer would not dream of reverting to the non-crystal controlled front end receiver for Amateur band working. It is admitted that the final contraption is

	LISTING
Call No Ch	Call No Cir
VK3BZ 3 17	6 VK4RT _ 22 124
VK4HR 12 17	
VK6RU _ 2 16 VK4FJ _ 21 16	
VK3EE 10 16 VK3JD 1 15	3 VK5MS 24 109
VK4FJ 21 16 VK3EE 10 16 VK3JD 1 15 VK3ATN 26 15 VK4KS 9 15	
	3 VK3WM 29 109 2 VK3HO 25 103
	3 VK3WM 29 109 2 VK3HO 25 103 0 VK2ADT 13 102 1 VK2AHA 15 102 1 VK6PJ 19 101
	1 VK2AHA 15 102
VK4RW 23 14	1 VK6PJ 19 101
VK3AWW 14 14 VK3JE 7 13	
VK3JE 7 13 VK4WF 16 13	9 VK3GG 18 100 7 VK5LC 27 100
VK6DD _ 6 12	7 VK5LC 27 100 6 VK3AUP 30 100
	C.W.
Call No. Ctr	Call No. Ctr.
VK3BZ 6 22 VK3FH 15 20	2 VK5FH 31 134 5 VK3JI 25 131
VK4HR 8 20	0 VK4RF 11 125
VK3KB 10 20	0 VK3HT 37 124
VK4FJ 29 19	1 VK3YD 27 123
VK4FJ	5 VK3EK 3 122 5 VK3PL 38 117
VK3CX - 26 17 VK5BY - 45 17 VK2EO - 2 17	2 VK3UM 12 116
VK2EO 2 17 VK5RX 23 15	0 VK2OY 44 115
VK5RX 23 15 VK6RU 18 15	9 VK7LJ 24 114
VK6RU 18 15 VK5BO 33 15	8 VK4DA 7 113 7 VK7LZ 17 112
VK3CN 1 15	VK4RW 47 111
VK2GW 16 15	1 VK3RJ 42 108 0 VK4RC 13 107
VK6SA 28 15	0 VK4RC 13 107
VK4QL - 36 14 VK4DO - 20 14 VK3XO - 43 14 VK3VW - 4 14	6 VK9XK 41 107 4 VK2AEZ 35 105
VK3XO _ 43 14	4 VK6KW 40 104
VK3VW 4 14	3 VK2YC 34 103
VK2QL 5 14 VK3XK 30 13	2 VK3PG 46 102
VK3XK - 30 13 VK3JE - 21 13	8 VK3APA 14 101 7 VK3NC 19 101
VK2EO 2 17 VKSRX 23 15 VKSRV 123 15 VKSRU 18 15 VKXEO 33 18 VKXEO 15 18 VKSEO 30 18 VKSEO 30 14 VKSEO 43 14 VKSEO 43 14 VKSEO 51 VKSEO 51	7 VK3NC 19 101 5 VK2OA 32 101
	VK7RK 22 100
Call No. Ci	DIN No. CT.
	1 VK5LC 55 118
	3 VK7LZ 23 116
VK4FJ 32 20	6 VK2ASW 53 114
VK6KU 8 20	3 VK6PJ 44 115
VK3JE 12 19	8 VK3JA _ 43 114
VK2NS 16 19 VK3HG 3 18	VK2ADT 14 113
VK4EL 10 17	5 VK3MM 49 111
	1 VK4RC 21 110
VK2DI _ 2 17 VK4DO 15 16	0 VK3ZB 34 110
VK4DO 15 16 VK3KX 1 16 VK4KS 24 16	8 VKUXK 54 109
	7 VK3KR 56 107
VK4RW _ 52 15	5 VK2YL 11 106
VK4RW - 52 15 VK9GW - 48 15 VK3AWW - 45 15 VK3LN - 29 14 VK5FL - 26 14 VK4WF - 40 14	3 VK9DB 59 106
VK3LN 29 14	4 VKSWT 50 105
VK3LN 29 14 VK5FL 26 14	4 VK6WT - 58 105 3 VK2VN - 18 104
VK4WF 40 14	1 VK4UL 27 104
VK3HT 41 14	1 VK6PW 50 104
VK3MC 5 13 VK3OP 19 13	VK2HZ 17 103
VK6DX 42 13	7 VK2TI _ 37 103
	6 VK3YS 57 103
VK2ADE 28 13	3 VK7RK 31 102
VK3JI 33 13	1 VK4TY 35 102

VK5HI . . 51 101 VK2TG . . 39 100

not very "commercial-looking" in ap-pearance, but the original has been from the start a purely experimental con-sideration. It represents the culmination of an idea, in fact, a kind of "Paddy's market Collins outfit," if that august Corporation will pardon the don't have dollars to consider otherwise!

A final word about the i.f. tuners. It is realised that in this country there have been virtually none of the Command receivers covering the 1.5 to 3 Mc. range (to say nothing of the broadcast model), but there have been quite a few of the 3 to 6 Mc. and 6 to 9 Mc. models sold through dealers, etc. A little figuring will show that various crystals can be applied with these higher frequency units, but the idea of the expanded dial may not be feasible. It is easy enough, however, to make a card scale that can be cemented to the front of the existing circular metal dial, and to calibrate this as required

Note that the circuit includes a crystal diode noise limiter in series in the 110 Kc. second detector. This can be a or the equivalent British dlode made by G.E.C. and now available around the

Australian radio trade. It will be obvious that the general principle of this receiver combination is applicable only to coverage limited to applicable only to coverage limited to the narrow frequency needs of our popular Amateur bands. It would not be a simple matter for the receiver dabbler to try to incorporate the crystal front end idea in a general coverage (communication) receiver.

BOOK REVIEW

"The Radio Amateur Operator's Handbook"

This little handbook, compiled by the staff of "The Radio Constructor" in collaboration with the International Short Wave League is a very compact summary of those charts and tables which all Amateurs and Short Wave Listeners use at some time or other.

Listeners use at some time time.

International Amateur prefixes are listed, both alphabetically and country. Time conversion charts, accountry. Time conversion charts, accountry. ountry. Time conversion charts, ac-curate frequency transmissions, "Q" code, signal reporting systems and similar information, well presented in 48 pages, make this a useful reference for both the DX old-timer and the new "Z" operator.

Our copy was received direct from the publishers, "Data," Publications of London.

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3.5 - 3.8		†576	585
7 - 7.15		1,215-	
14 - 14.35		2.300-	2,450
21 - 21.45		5,650-	5,850 ,,
26.96- 27.23	**	10,000-1	0,500
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50 - 54	. 1	30,000 M	c. and
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FOR MONTH OF JUNE, 1955 NEW CALL SIGNS

VK- New South Wales 2DD-A. Davis-Rice, 7 Raymond Rd., Neutral Bay, Sydney. 20K-J. T. Lake (Major), 48 The Promenade. Sans Souci. 2APF-F. W. Fowler, 4 Thompson Cres., Tamworth. 2AUM—A. Maxwell, 24 Coleman St., Westmead. 2ZAU—K. Woodward, 35 Raeburn Ave., Castlecrag. J. S. Adkins, 10 Middle Head Rd.,

2ZBS-W. J. Steuart, Hotel Acton, Canberra, Victoria 3JL—J. R. Lancaster, 259 Nepean Highway, Parkdale, S.II. 3SD—R. V. Wilson, 9 Vine Grove, Carnegle. 3TG—E. L. Blackmore, Dundas Rd., Mary-borough. 3VW—G. Stoble, 70 Bell St., Heidelberg West, N.23. 3AVH-J. F. Hirst, 853 Drummond St., North Cariton, N.A.

3AVR.—H. V. C. Randall, C/o. J. C. Martin, 4
Hooper St., Murrumbeena.

3AVM.—G. A. MecFarlane, Pearsondale, via Sale.

3ZBG.—J. G. Goodall, C/o. S.R.W.S.C., Tocumwal Rd., Numurkah.

3ZBK.—R. G. Kirby, Lot 56, Pearl St., West Essendon.

3ZBL—E. L. McLean, 1 Acacia St., Murrum-beena, S.E.9.

South Australia
SSG-S. G. Tonkin, 9 Abbotabury Place, Evandale, Adelaide, StL-L. Lindley, 56b Brighton Rd., Gleneig.
SZAD-P. M. Williams, 42 Harrow Rd., Somerton Park. 5ZAM-J. McG. Moffatt, 8 Swan Terrace, Port Adelaide.

5ZBC-L. E. Coombe, 44 King St., Mile End.

Western Australia

6ZAC-J. F. Chambers, 17 Leon Rd., Dalkeith.

Tasmania
 TDJ-D. H. Johns, 23 Waterworks Rd., Dynnyrne, Hobart.
 TST-Launceston Army Signals Radio Club, Paterson Barracks, Launceston.
 ZAJ-F. J. Edwards, 9 King St., Sandy Bay.

9WI-Wireless Institute of Australia, Papua-New Guinea Division, Station: Five Mile, Port Moresby; Postal: Box 56, Port Moresby.

CHANGES OF ADDRESS

New South Wales E. Behrmann, Flat 6, 11 John St., 2BD_A

2D.—A. E. Behrmann, Plai 6, 11 John St., 2MJ—Aer, Ship, Lot 20, Tenge St., 2ast 2TU—A. T. Bobber, 33t West St., Crows Nest 2ADB—A. A. Cheetham, 70 Edward St., Redfern, A. C. Cheetham, 70 Edward St., Redfern, North Bond, 11 Brighton, Boulevarde, North Bond, 13, Phys. Redfern, 12 Capt. 11 Co., 24 Cheetham, 24 Che

Victoria

3BC-B. C. Cooper, 48 Spicer St., Beaumaris. 3CM-H. G. Selman, 10 Charles Court, West Moolap, Geelong. 3ACD-R. A. Hipwell, "Ralern," Pier St., Dromana.

3AIL—I. Lecis, 9 Moorookyle Ave., Oakleigh,
S.E.12.

3AJQ—J. R. Kling, Little Opie St., Lower Fern-

3AJQ—J. R. Kling, Little Opie St., Lower Ferntree Gully.
3AJS—J. S. Duncan, Station: \$\bar{z}\$ Dandenong Rd., Caulfield; Postal: C/o. Commercial Bank of Aust. Ltd., \$\alpha 2\$! Bourke St., Melbourne.
3AKC—G. J. Griffiths, 29 Ryley St., Wangaratta.
3AWV—G. C. R. Waters, 12 Allambee Crex. allourn.

H. Haymes, 57 Latham St., East Bentleigh. 3ZBW-D. G. Walker, 1 Goode St., East Mal-vern, S.E.10.

vern, S.E.10. Queensland
4DA-M. J. Swaby, Station: 106 Drayton St.,
Dalby; Postal: 95 Cunningham St., Dalby,
4FH-J. F. Bull, Flat 4, Vella's Bidgs., Victoria
St., Mackay.

4HM—H. J. Murphy, 39 Hunter St., Woolcowin, N.3. 4KB—P. J. Kelly, Cambridge St., Camp Hill, Brisbane.

South Australia 5DZ-J. A. Casev. 26 Moore St., Enfield. Western Australia

6AE-H. A. Lee, 96 Beatrice St., North Innaloo. 6LJ-J. Mead. 110 Edenborough St., Mt. Hawthorn.
6ZAK-D. J. Knox, 3 Kingsley Drive, South
Guildford.
Tasmania

7PF-P. D. Frith, Penquite Rd., Norwood, Launceston. 7YH-F. W. Hand, Esplanade, Seven Mile Beach. CANCELLED CALL SIGNS

VK—SSG—S. G. Tonkin. Now VK3SG*.
2AFS—R. V. Wilson. Now VK3SD*.
2AFS—R. V. Wilson. Now VK3SD*.
3AFS—R. V. Wilson. Now VK3D*.
3GG—J. R. Loncaster. Now VK3D*.
3GF—J. T. Luke (Major). Now VK3D*.
3GF—J. T. Luke (Major). Now VK3D*.
4AFI—R. Discharge. Now VK3AVH*.
4AFI—R. Thoriey.
1DJ—D. H. Johns. Now VK7D*.
3VW—G. Stoble. Now VK3D*.
*See New Call Signs.

TRANSISTOR ORM

Has anybody encountered Transistor QRM yet? It is the latest bugbear in U.K., it having been found that some transistor hook-ups, if used with a normal antenna, may cause serious in-terference with neighbouring b.c. receivers of conventional type.

It is thought that things will be bad enough, without having a plague of hissing transistors adding to t.v.i. prob-lems in the near future! Most areas are notorious for electrical appliance din.

—VK2NO.

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National Field Day, 1955, Results

The Field Day for 1955 was cancelled by the Contest Committee because of extensive emergency work in New South Wales, but after requests by in-terested Amateurs, the Contest was held

on 3rd April.

Participation seemed less than in previous years and a perusal of logs shows that active portable stations numbered in VK2, 4; VK3, 16; VK4, 1; VK5, 1; with no indication of activity by the other Divisions.

The top scorer this year was VK3YS operating exclusively on 144 Mc. with 0.5 watt input to a 6AK5 and a five over five beam.

Score is the highest gained in any



VK3ARJ 6.00 points Listener

N. G. Clarke (VK2) 52 points The Contest was set for early March by the Committee, following a directive

by Federal Convention that it be held at this time, but comment from entries indicates that a holiday would be more suitable as it allows an extra day following the Contest and that April can be decidedly cold for this type of contest.

The Committee will review the rules

in the light of comment received and endeayour to suggest amendments which will better meet the needs of the Contest.

Awards

VK3YS—1st in Australia. VK2WI—1st VK2, Open Section. VK3IE—1st in the Phone Section (excluding VK3YS).
VK5PS—1st, VK5 Phone Section.

VK3AHH—1st in the C.w. Section. VK3AHJ—1st VK3, Fixed Station. N. G. Clarke, VK2 Listener.





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BI-MONTHLY VICTORIAN SCRAMBLE In accordance with a motion passed

at the 1954 State Convention, the Div-isional Contest Committee of the Vic-torian Division has organised this Bimonthly Victorian Scramble in order to foster Amateur Radio activity on all frequency bands allotted to Australian Amateurs. It is further intended to train, by means of this Scramble, Victorian Amateurs for the possible requirements of Civil Defence Communication work. For this reason, the rules require participants to show ability in speed and accuracy.

1. The Bi-monthly Victorian Scramble is open to all transmitting Amateurs resident in the State of Victoria, and to Short Wave Listeners resident in the Commonwealth of Australia. However, only financial members of the W.I.A. are eligible for awards. Transmitting par-ticipants will endeavour to contact as many other Victorian stations as possible.

2. Until further notice, the Scramble is to be held on each first Monday of the months October, December, February, etc., during the period 2000 to 2200 E.A.S.T.

3. Participants may enter one of the following sections:

Section A: C.w. only. Section B: Open—C.w. and Phone. Section C: Phone only. Section D: Receiving Section.

4. Participants may use any fre-quency band allotted to them, but only one contact per station is permitted, regardless of the band of operation.

observe Participants must observe all regulations as laid down in the "Handbook for the Guidance of Operators of Amateur Wireless Stations." Any breaches will lead to disqualification.

All transmitting stations entering the Scramble will call "CO VK3." Transmitting stations are required

to exchange the signal report and two groups of five letters each. The procedure shall be as follows: Each participant selects two groups of five arbitrary letters at the beginning of the Scramble, passes them to the first station contacted.

and receives two groups. In following contacts the participant will pass the groups received in the preceding contact. Example (c.w. contact): Station "X" passes "589 HBDEF QLMRS" to station "X" and receives "579 AMREF DBECG". Next, station "X" contacts station "A" contacts station "A" contacts station "C" contacts station "Z" contacts station "Z" will use the groups "DRAIG ion "X" will use the groups "DRAIG ion

GHIKO" for the following contact, and The above example is also valid for phone contacts if the RST report is replaced by an appropriate RS report. A complete exchange of reports and groups must take place before any points may be claimed.

8. Transmitting participants score one point per contact.

Short Wave Listeners will record contacts of stations participating in the Scramble. One point will be earned for Scramble. One point will be earned for logging the contact of a station, complete with report and groups sent by that station. Only one such log entry may be made of any station, regardless of the band of operation. The call sign of the station being contacted must also be recorded in each case.

10. Logs of transmitting stations must show in this order: Time (E.A.S.T.) band of operation, call sign of station worked, report and groups sent, report and groups received

Logs of receiving stations must show in this order: Time (E.A.S.T.), band of operation, call sign of station heard, report and groups sent by that station, call sign of station being contacted.

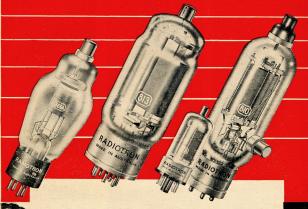
Participants are required to submit a signed declaration that all P.M.G. regulations and Scramble rules have been observed.

11. Certificates will be awarded to the top scorer in each section.

12. Entries of all participants must reach the Divisional Contest Committee, Wireless Institute of Australia, Vic. Div., 191 Queen Street, Melbourne, C.1, on or before the last day of the month in

which the Scramble was held.

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Today's high standards of radio performance are dependent upon the use of first quality components. Radiotron valves are manufactured to exacting stand-

ards which ensure you of the ultimate in performance at all times.

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RADIOTRON
LGAMATED WIRELESS VALVE CO. PTY.

DX ACTIVITY BY VK3AHH+

PROPAGATION REPORT

3.5 Mc.: Conditions for North America existed between 0730z and 1300z. Break-throughs to Africa were reported around 1800-1900z. Affres were reported around 1990-1990.

The: Consistent conditions for North account of the control of the cont

Western Australia, respectively.

11 Mac. Again, an occurate statement on the times of break-through in efficiency of the statement of the sta

21 Me.: Conditions on this band have deter-iorated but break-throughs to North America (2300-04002), Africa (0600-06002) and Europe (0900-11002) have been reported.

27 and 28 Me.: As was to be expected, propagation conditions were not as good in July as they were reported for preceding months. No reports have been received.

NEWS AND NOTES

The wheels of history turn through decades and centuries to better technical achievements. If we ever had space vis-itors, they were far too shy to get out and tell us about their trip, about our own ionosphere, and where we have to tighten a few screws to improve conditions. Thus we have to do it ourselves. Our tiny satellites are a first step to-Our tiny satellites are a first step to-wards practical and effective ionospheric research. And perhaps our first space ships will cruise around before this eventful century is over. Get ready for the "Worked All Planets" award!

Back to earth, ill weeds are growing apace in our 7 Mc. garden! Another commercial c.w. station was observed on 7013 Kc.: VU9 in contact with SOX (from 3OH).

Can you receive on 7 Mc.? Please have another look at the list of b.c. stations there—in "A.R." 7/55—and send in your

report. Thank you!! KC6CG is looking for VK5-Northern Territory on 14 Mc. (from 3KR).

G3HPM will operate ZD9AD on all bands during an expedition on Gough Island. (from 3YS)

ZC3AC appears to be active again from Christmas Island (from S.C.DXC.). Legitimate VP7 stations on Bahamas Island have the letter "N" after the numeral

BV1US and C3WV represent Formosa. (from S.C. DX C.).

Canadian Maritime Mobile Stations use VE0 as prefix (from 3YS). Andoy Island is on the map with

YJ1DL's frequencies are 7000.5, 14001, and 14055 Kc. (from 3KR and 3YS).

OTHS OF INTEREST From SLAN, LV INTEREST From SLAN, LV INTEREST WAMB-P-D. Box & Vibertiane, Laos, AP2Q-121 Gar Wood Rd. Quetts, Pakistan, AP21—8 Roberts Market, Quetts, Pakistan, AP21—8 Roberts Market, Quetts, Pakistan, ODAAY-Box 3647, Beiruth, Lebanon, ODAAY-Box 3847, Beiruth, Lebanon, OSAU-Box 1848, Elizabethile, Belgian Congo, KAGIJ-F.E.A.R.L., Box III, A.P.O. 506, C/o. P.M. San Francisco, Calf.

† Hans J. Albrecht, 10 Belgravia Ave., Box Hill North, E.12, Vic. * Call signs and prefixes worked. z = zero time—GM.T.

ZC2PJ-P. J. Reeves, Direction Island, Cocos-Keeling Group, Indian Ocean. MP4QAL-Fergus Walshe, Decca Navigator Co., C/o. Shell Oil Co., Doha, Qatar. ACTIVITIES

3.5 Mc.: It is nice to have a report on 3.5 Mc. from Western Australia; thanks 6EJ1 6EJ reports Ws. Eric BERS195 follows with VRACT, ZM6AS, W3, W6, W7, ZSSCV (1815z), ZSSPM (1845z). The next in line is Dave Jenkin who heard W7, W3, W5, W8, W4, W6, W9, and 3AHH adds Ws.

STATE OF THE ACT OF TH

21 Me.: Neville 2APL heard ZS5JY. Syd. 3CI reports W6*, W9* and said that 4NG heard Europeans and Africans. Frank 3ZU heard W3. W4. W5. W6. Jim Hunt and brother report EUROPEANS AND AFFICANS, FRANK SZU BEARG WS W4, W5, W6, Jim Hant and brother rejor LUEDLY, HPSFL, CEIBL, TIZWM, FRIZA-MPHBEL, VSGCW, VRZGC, KASHK, KASWK MPHBEL, VSGCW, VRZGC, KASHK, KASWK VDERO, W1, W2, W3, W4, W6, W6, W7, W6 W9, W6, KAKZK,MM, W3UKX/MM, W3OZA, MM, WSAXI,MM, W6MZV/MM. Norman Clarke W6, W8, VSGE.

27 and 28 Me.: No reports were received

27 and 28 Mc.: No reports were received.
Rare QSL2 were received by: 2.84H; VQ4EU
VSSXZ, E14X, EA4AV, YNIAA, FRIZA, YKIAA
VQGC, MPRKAC, ZBICH, TIRC. 2AMB
VRIAA, ZC2PJ, VQ4EG, VPSSC, ZMGAS, VPGCT
DDBH, ZG4P, SHI: KE1TR, CNBMM, 9AU
FK58BC, YNIAA, BERSHS: LUWK, VUZRC
ZSK, HVISS, YVSDE, KV4FK. ZEZEA, HVISS, YVADE, KV4HK.

Thanks to the Northern and Southern Callfornia DX Clubs and VKs 2ACT, 2AHH, 2AMB
2APL, 3CI, 3HG, 3JA, 3RR, 30H, 3TE, 3XB,
3YD, 3YS, 3ZA, 3ZU, 3AHC, 3AHM, 4NG, 4RW
SHI, 3RK, 6EJ, 9AU, and sw.1s. BERSISS, Jin
Hunt and brother, Dave Jenkin and Norman

Clerke

PREDICTION CHART FOR SEPT., 1955



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FIFTY MEGACYCLES AND ABOVE

NEW SOUTH WALES

NEW SOUTH WALES

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in particular, thanks to the 19 stations who sent before an impact to the Term the 2012-200 purpose to the third to the 100 purpose to the 100 pur

cannot forms end. He was not the he was the Markowski of the Leichard War. And the Markowski of the Leichard War. And the Leichard W

indeed cervited out on a v.k.f. wavelength, some The next lectures was given by Harry Good-man, 22.40. Barry pervolved upon 5 of Harry Good-man, 22.40. Barry Mary Carlotte, 22.40. Bar

was spent.

Hugo 2WH is on again, and putting a fairly consistent signal into Sydney.—2AJZ.

Not even a very wet night dampened the free was an excellent turn up, eleven care. The was a series of the part of th

LES AND ABOVE as cannot also also also as control station and was assisted by 22A with cross beginning, many thanks also and Jack work and the property of the

North Dench who recently passed his A.O.L.C.P.

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SOUTH AUSTRALIA

SOUTH AUSTRALIA

59 Mc.: Last month saw a rise in the number of saltons operating on this band. Jack SLR of SLR of

hiding and is back on 50 Mc. again.

Tom STL is, from reports, going to operate
on 50 Mc. this coming season. As most of you
know. Tom is stationed at Alice Springs. You
had better get cracking Tom because all the
Australian and New Zealand 50 Mc. boys will
be after your QSL card in order to quality
for their WA.S. on 50 Mc. Certificate.

for their W.A.S. on 50 Mc. Certificate.

144 Mei. Three new stations bobbed up on 2 mc. last month, viz.: Les \$A.X. Comps. SEP

Located in Gawler and Des 191X is located shout two hundred yeards away from Col. \$RO in signal into Addiside. Let? are gare consistent of \$20 pa. 10 w. Input. 12 el. all driven array frequency is 1444 Mc. Comp. EBF is using a 2EEO pa. 15 w. input. 4 el. Yagi and converter has yet to come. Both Les and Comps. are

All Models Exhibition

At the All Models Exhibition and International Trade Fair to be held at the Exhibition Buildings, Melbourne, from 25th August to 10th September, the 25th August to 10th September, the Wireless Institute will be exhibiting from 25th August until the 3rd Sep-tember only. This is a change of date from that advertised in last month's magazine and will be of interest especially to Country and Interstate Am-ateurs whose help with contacts on 2, 20, 40 and 80 metres will be greatly appre-ciated by those operating from the stand at the exhibition.

building 100w flash consisting of p.D. 6166.
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using 8 microwatts:
288 Mc.: Denis 6AW has been busy experimenting with 19Es as an amplifier on this
band. He was unable to drive them with his
632 and intends to try a pair of 19Es as triplers
driving another pair. Rolo 5BO vouches that
Denis' 2 watts to his 632 produce the best 288
Mc. signal he has heard-6ZAA.

S.W.L. SECTION*

S.W.L. CONTEST

S.W.L. CONTEST
The winners of the S.w.l. Contest sections were: Section 1, largest number of QSLs on Amsteur Band,—Ian J. Hunt, with a total of 121 QSLS. Section 3, Broadcast Band DX—Ian R. Woodman, with a total of 62 QSLs. Section 4, largest number of QSLs in all sections—Ian J. Hunt. Section 2—There were no entries in this

NEW CONTEST

NEW CONTEST

During the menth of September an S.w.l. Contest will be hold from the last to the 30th and 6 netrees and is open to all s.w.l's.

The Contest winner will be the one who for the second of the second o

Compiled by John Wilson, WIA-L3004, 37 Rayment Street, Alphington, N.20, Victoria.

THE MERTING

The S.w.l. Group met in the rooms, 191 Queen Street, at 200 hours. The meeting took the form of a Constructional Night when members brought along pieces of equipment under construction. A good time was had by all in ironing out those bugs, etc., in the gear.

From Len Cragen we received news to the effect that the VK5 Division met in the Central Methodist Mission rooms at 2000 E.S.T. on 11th July. QSL cards were distributed and members were issued with official numbers. Many thanks to Rodger Gillard who brought along his ARS receiver and gave the younger ones a chance to hear the short wave and Amsteur bands.

Len is now VK5 correspondent, and our thanks go-to our retiring scribe, Mac Hilliand, for his past services.

OFFICIAL S.W.L. NUMBERS Federal Executive have now granted official W.I.A. s.w.l. numbers. For Victorian Division members these numbers are WIA-L3001, WIA-L30(2, etc., and for South Australian Division members, WIA-L50(1, WIA-L50(2, etc. Associate members who wish to have their own numbers are advised to write to the Divisional Secretary of their State, who will then issue a number to them.

INTERSTATE NEWS

Information from other Divisions on the activity of s.w.l's. in their State would be wel-comed for the magazine. Hems of interest should be forwarded to John Wilson, (address below these notes) before ist of each month.

NEW PRIPAIR

From U.S.A. we received two monthly reports on VK stations heard in U.S.A. The reports are from H. Southwick, 316 Bank Street, Fall River, Mass, U.S.A. Thanks very much for the reports, Mr. Southwick, as we here in VK land appreciate the knowledge of the strength our signals being heard by s.w.?s. in W land. Mr. Southwick is ex-WiFS. He reports hear-ing VKs 2ZR, 2LX, 2NY, 2FU, 2XZ, 2XJ, 2AU, 3XU, 3XB, 3YP, 3ARO, 3FH, 3GU, 3VF, 3TK, 3ZO, 3NM, 3BG, 3MC, 3HI, 4YP, 4BB, 4BM, 5JO, 5KU, 5BO, TUW-all at SS-

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"FLUON" SOCKETS B7G 7-pin Miniature, 10/6, Screening Can

2/3 extra. B9A 9-pin Noval, 11/5. Screening Can 2/6

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"NYLON" SOCKETS Type L718/S 7-pin Minlature, 8/- with Can. Type L720/S 9-pin No-val, 9/5 with Can. (For operation to 200 Mc.)

MICA-FILLED SOCKETS-

Teletron Type ST27-L 7-pin Miniature (less Can), 14/- dozen. Teletron Type ST57-G/2 7-pin Miniature (with Short Can), 3/6 each

Teletron Type ST57-G/3 7-pin Miniature (with Long Can). 3/8 each.

Teletron Type ST19/L 9-pin No-val (less Can), 16/4 dozen. Teletron Type ST59-L/2 9-pin Neval (with Short or Long Can) 7/- each.

McMurdo 7-pin Miniature (with Can), 3/8 each. McMurdo 9-pin Noval (with Can),

7/- each. Belling & Lee B8A Bakelite Wafer Socket, 2/3 each.

Prices include Sales Tax

"WILLS" CHASSIS PUNCHES



Radio and Electronic Engineer and Constructor. Gives that "clean cut" professional appearance.

8"	. 19/	1"		2	9/10
2"	. 19/1		/16"		33/2
8"	. 19/1	1-1	1/4"		40/-
/16" .	. 21/0	1-1	1/2"		45/-
4"	. 23/3	3 2"		. 7	60/-
Special	Sizes	Made	To	Orde	r.
ovente	01 boo	non he	1	3500	

Finest Grade Tool Steel.

S.W.R. BRIDGE KIT SET (per "QST," March 1955)

£3/10/- (inc. Sales Tax) Includes: Die-Cast Metal Instru-ment Box 4½" x 3½" x 2½", Ger-manium Diode EA50 (1N34), Pos-itive and Negative Meter Plug and Socket, two Disc Ceramics, two Co-axial Plugs and Sockets, Co-axial Connecting Cable, Five non-inductive Resistors, Stand-off Inssulator, Meter Lead, Circuit and Operating Instructions. A "must" for every Ham Shack.

Aerial adjustment and efficiency, the easy way. Avoid Standing Waves and T.V.I. When ordering specify whether for 50 ohm or 70 ohm.

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NEW SOUTH WALES
President: Jim Covin, VIXIC.

18.73.0. Spinor, VIXIC.

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President: G. Dennis, VKSTF. Secretary: C. Gibson, VK3FO. Administrative Secretary: Mrs. May, C.O.R. House, 191 Queen St., Melbourne.

Mesting Wight Townson of each non-instructure of the National College.
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et the Radio Science of the National College.
Divisional Sub-Reitler K. E. Pincott, WKART,
et al. College of the National Colleg

ton, K.D.

President J. T. Hope, YKKXL

President J. T. Hope, YKKXL

G.F.O., Rithbase, Coung, YKKXL

G.F.O., Rithbase, Coung, YKKXL

Meeting Night: First Friday in each month at

Sirect, Clic Geographical Society Rooms, Ann

Divisional Sub-Editor: J. T. Hope, YKKXL,

KONJ Parado, St. John's Wood, Antprove,

G. B. Buranda; Outwards—Miss Clair O'Brien,

Si Jardine S., Stafford.

President: G. M. Bowen, VK5XU. Secretary: R. G. Harris, VK5RR, Box 1234K, G.P.O., Adelaide. Telephone: J 1151. Meeting Night: Second Tuesday of each month at 17 Waymouth St. Adelaide.

Divisional Sub-Editor: W. W. Parsons, VKSPS, 10 Victoria Avenue, Rose Park. QSI. Bareau: Geo Luxton, VKSRX, 8 Brook St, West Mitcham, South Aus. (Inwards and Out-wards).

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Seerslay: W. G. Tatl, Box 371B, G.P.O. Hobset,
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Seerslay: G. Tatl,
See

FEDERAL. LIMITED (TECHNICIAN) LICENSES

In order that a clear picture can be obtained for the clear picture can be obtained for the cleanse figures of recent years. The following list shows the number of licenses issued and cancelled each month (where size of the clean state of the clean size. As the first Z call sign was issued in June, 1954, there are two years with no Z calls and one year with full calls and Z calls.

	195	2-1953	195	3-1954	-	934-1955	-		1954-1955	
Month	New Calls Issued	Calls Cancelled	New Calls Issued	Calls Cancelled	Ne Cal Issu	ls Calls	led	New Calls Issued	Calls Cancelled	Z Calls Cancelled replac. by Full Calls
June	21	11	11	21	1:	7		18		-
July	12	9	7	6	16	13		3		_
Aug	13	10	10		1	2		1	-	1
Sept	1			. (1	11		9	-	_
Oct	36	22	32	41 }	11	6		20	-	_
Nov	9	7	9		13	10		5	-	_
Dec	7	4	3	9	1			13	_	1
Jan	21	12	12		15	7		6	-	_
Feb	11	6	4	13 }	13		-	16	_	1
Mar	13	7)	19	,	1					
Apr	13	18 }					****	5	1	-
May	18	4	16	19	13	4	****	7	-	4
Total for year	174	110	123	146	151	82	-	103	1	7
Net increase for year		64		-23		69			. 95	

LETTER FROM PRESIDENT A.R.R.L. Federal Executive has received the following letter from the President of the American Radio Relay League, Mr. G. L. Dosiand, WoTSN. Executive appreciates the sentiments expressed therein and on behalf of the Amateurs of Australia has responded suitably. West Hartford 7, Conn., U.S.A. Wireless Institute of Australia, Box 2611W, G.P.O., Melbourne, Victoria, Australia,

Gentlemen,
It gives me a great deal of personal satisfaction, in my capacity as President of the
American Radio Relay League, to forward the
following action of its Board of Directors,
unanimously adopted at the Annual Meeting

This survey is based on the monthly list-issuad by its Dapastern's ready printed in Valla Full call signs issued the ready printed in Valla Full call signs issued the monthly from the number of new calls and from the number of the control of the control of the control of the ment of cancelled Z calls have been included among the new full call signs and are listed separately from other cancellations of Z calls. These figures do not lend themselves to the formation of any definite conclusions, but in themselves form a basis for thought. operations, in International harmony and the advancement of Amateur Radio world-wide I would like, as President of the International Amateur Radio Union, to add my own deep actification of the International Amateur Radio Union, to add my own deep actification of the International Amateur Radio Union, to add my own deep actification of the International of the International Control of the In With cordial 73, Sincerely yours, (Signed) G. L. DOSLAND, President.

FEDERAL QSL BUREAU RAY JONES, VKSRJ, MANAGER

The L.A.B.R.E.—the national society for irazil—announce the addition of Navassa Island

MAY JONES, VERBI, MANAGER
THE LALBER, E-the national poolety for
CCI. to the Worked All America, (W.A.A.)
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"Whereas, these same I.A.R.U. Societies have contributed to the advancement of peace-ful International relations by the exchange of Amateur Radio communications between themselves, the United States, its possessions and Canada. and Canada,
Be it resolved, that the Board of Directors
and the staff of the American Radio Relay
League, extending their hands in friendly
greeting to all LA.R.U. Societies, demonstrate
their appreciation and faith, created by such

of the Board, held in Hartford, Conn., on 13th May, 1955:
"Whereas, the Radio Amateurs of the United States, its possessions, and Canada, are aware of the co-operative actions taken by LARKU. Societies and their memberships in many In-ternational competitions, and

Amateur Radio, September, 1955

"ACOS" CRYSTAL MICROPHONES and MICROPHONE INSERTS

A Complete Range For Every Purpose

DESK OR HAND MICROPHONE Housed in attractive plastic case, this Mic-MIC 36



£6/18/6

rophone is ideal for home recording and public address, etc. Response unexcelled for its size and price. The performance is not affected by vibration, shock or low frequency wind noise. Omni-directional frequency response substantially flat from 30 to 7000 c.p.s. Recommended load resistance not less than 1 megohm dependent on low frequency response. Can be supplied complete with switch and floor stand adaptor as required at a small extra cost.

HIGH QUALITY MICROPHONE

Designed to meet even the most exacting requirements, this Microphone incorporates the world famous floating crystal sound cell construction. Its special characteristics are that its

fine performance is not affected by vibration or shock. The fidelity is not impaired by low fre-quency wind noise.

Recommended load resistance—not less than 1 megohm.

Output level -65 db ref. 1 volt/dyne/cm2. Frequency response—substantially flat from 30 c.p.s. to 10,000 c.p.s.
Directivity—non-directional.

Size-21" spherical diameter

£24/19/6 Connector-Standard international 3-pin.

GENERAL PURPOSE MICROPHONE The MIC 35, undoubtedly the best value ever offered, is ideal for amat-MIC 35



eur transmitters, public address, etc. Housed in an attractive die-cast case, it features a high sensitivity and sub-stantially flat characteristics. Provided with a built-in shunt resistance of 2 megohms, it will, when connected to the grid of the input valve, give a substantially flat response from 50 to 5000 c.p.s. SPECIFICATION
Output level: —55 db ref. 1 volt/dyne/cm².

Cable—approx. 4 ft. of co-axial supplied.
Weight—6 ozs. unpacked, 7 ozs. packed.
Dimensions—microphone only 2½" x 2½" x ½"

TABLE AND STAND MICROPHONE

This omni-directional Microphone is robust in MIC 22 construction, with a pleasing appearance. Vibra-tion, shock or low frequency wind noise will not affect the performance. The low frequency cut-off is dependent on the load resistance. The cutoff is given by the quotation, F = 80 ÷ R, where F = c.p.s., R = megohms. An adaptor (floor mounting) is available at low extra cost.

SPECIFICATION Output level = -50 db ref. 1 volt/dyne/cm². Output impedance—equivalent to approximately 0.002 uF, (0.8 megohm at 100 cycles).

Frequency response—substantially flat from 40 to 6000 c.p.s. Recommended load resistance—not less than 1 £9/18/6

megohm, dependent on low frequency response.

LAPEL MICROPHONE



£5/19/6

Designed to give freedom of movement, this MIC 28 Microphone is small and non-directional. Housed in a soft moulded rubber case, which gives protection against shock, it is provided with a pin at the rear of the case for pinning to the lapel. SPECIFICATION

Output level-approx. -55 db ref. 1 volt/ dyne/cm2

Recommended load resistance-5 megohms. Frequency response—level throughout the whole of the audible spectrum. Capacity—0.0015 uF. at 1000 c.p.s. Impedance—100,000 ohms at 1000 c.p.s. Cord—6 ft. shielded cable. Size-1-9/16" wide x 21" long x 8" thick.

HAND OR DESK MICROPHONE MIC 33

This Microphone has been designed for the high quality public address and home recording field. High sensitivity and flat characteristics are obtained by a specially designed acoustic filter. Housed in an attractive plastic case with an unexcelled re-sponse for its size and price. Unaffected by vibration, shock or low frequency wind noise. Omni-directional frequency response substan-tially flat from 30 to 7000 c.p.s.



£6/18/6 MICROPHONE

CRYSTAL MICROPHONE INSERTS These inserts are available in varying sizes ranging from as small



EXCLUSIVE AGENTS:

as 15/16" square to 1-13/16" round, with various thicknesses from 7/32" to 9/16". Suitable for every purpose such as hearing aids, public address, tape recording, amateur broadcasting, etc., they have responses from 2250 c.p.s. to 3500 c.p.s. at 5 db to 30 db. Insert can be supplied with or without 10 meg. resistor as required.

MIC 32 insert, £2/15/6; all others, £1/19/6.

INSERTS

(MIC 23 illustrated)

AMPLION (A'SIA) PTY. LTD. SYDNEY, AUSTRALIA

Page 18

Despite the return to civilisation of Bill Storer, VKLIGS, and his marriage, he has left his entire continuing to handle all GSLs. FFJ. who is continuing to handle all GSLs. Felix, FKAAC, an forwarding a few GSLs from Action FWAAA, or Wallis Light, elastes that shortly, under the cull sign FKAAI/AMA, operating on board of the Color of the Co

FRAMI and FRAMI are sistently flum to Dune. Chair Hawker, VALIB, K.V.YALIC, presently at Swan IIII, states he does not expect to he shall be a support to the state of the st

FEDERAL AWARDS

W.A.V.K.C.A. AWARD Member Societies of the LARU, have been circularised with the rules appertaining to this Award. In addition, copies of the rules have been sent to the publishers of "CQ" and "Wireless World." No applications for the Award were received during the month of July.

DX C.C. AWARD

Appliesment. It is measury to point out to the property of the

out the card.

Unfortunately many overseas stations do not always fill out these details and I have recently these details and the proceeding these essential details. A card may be perfectly genuine and I will always give the conposition to certify to the genuineness unless the bulk of this data is given.

Some of the control of the c

Additional Countries and Amendments Since the publication of the last Official List Countries, the following amendments are

Since the publication of the hat Official List effective. The following amendments are effective. The following amendment are effective. The following amendment are effective. The following amendment price in 17.104 will be proport. All confirmations price in 17.104 will list that date will be credited to India. The following the follow

NEW SOUTH WALES

The July meeting of the N.S.W. Division was held at Science House, Gloucester St., on 27th July; a large attendance being recorded. The visitors were welcomed by the President, Jim Corbin, 2YC, and included Ray Priddle, 2WF,

SOUTH WESTERN ZONE W.I.A. VK2 CONVENTION

to be held at ALBURY

1st and 2nd OCTOBER

Programme:

Saturday, 1st October— Tour of Hume Weir. Catered Dinner, Saturday night. Films, Pick-a-Box, and other

competitions. Sunday, 2nd October-Transmitter Hunts on 144 and 3.5 Mc. bands.

Auction of Disposals gear. One Hour Scramble.

Blindfold Transmitter Hunt on 144 Mc. band.

Further information can be ob-tained from VK2RS at Albury, or VK2AJO at Coolamon.

2ABG, 2AIR (ex-9YY), 2DY and his wife, 2UC, 2DI, and the parents of VKIZM, who is now doing a tour of duty at Macquarie Island.

doing a four of duty at Macquarie Island.

In the absence of the Scertzer, Harry ACH,
the control of the Scretzer, Harry ACH,
duties for the evening. The small amount of
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most interesting fecture on the in the Antiestic
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enticutable to the construct of the second of the
tention on life in these regions. All voids this
these meeting was closed to allow members and
that indeed presents to meet one another.

We must asopolise for the complete lack of notes in the last issue of the magazine. A fortill the complete lack of a dose of the current 'flu in my case, the late arrival of notes from country areas, and the bardiness of the supropriate Department in calculations of the superposite Department in complete the complete of the complete

There is much activity at present in the local area in readiness for the R.D. Contest, many stations are heard again which have been more or less silent for some months. This Contest should be one of the biggest held and we hope that the results will show a great Improvement.

JEPA, 2ACD, AUR and others are looking for properties of the prope

30° is very diligently playing with a new boats, and the ZL Special, what about an article on the ZL Special, what about an article on the Laurer JAFF, give the best of the playing the p

2ASW rarely heard now, and this applies to 2PY (ex-2AXZ)—both are busy with the class. Any of you fellows who are interested in Radio and wish to get your ticket, write to the Class Secretary, Box 1734, G.P.O., Sydney, The class is very successful and you have the best of instructors so the rest will be up to you. Give

More and more subscriptions are awaited for the N.S.W. Amateur Co-operative to enable the N.S.W. Amateur Co-operative to enable the times. Please chaps send in youtlines of many times. Please chaps send in youtlines to jately to C. Quin, Hon. Sec., Box 1734, G.P.O., Sydney. We can, if you will help us, build for the future and make Amateur Radio bigger and better.

and better.

LAUW now operating from Binnelly, the call plugging along GDBJT tells me he has call plugging along GDBJT tells me he has call plugging and tell plugging and tel

band recently. 2NG still around.
Shades of Old England. On a recent weekShades of Old England. On a recent weekWith the assistance of Vie ZAWN, our heroest?)
managed to fire an arrow trailing a string over
were needed to accomplish this feat of arms,
despite a blustering westerly cross wind. Now
70 ft. mark. There's nothing to it—well practiculty nothing, anyway.

Tom 2AFN has a tale of woe these days. He is flat out digging foundation holes into rock for his new galvanised tower.

Have you sent your R.D. log in yet? If not, do so immediately. All logs must be forwarded through the contestant's Divisional Council (for membership checking) to reach the Federal Contest Committee in Adelaide on or before 19th September, 1955. Pest your logs to Box 1734, G.P.O. Sydney, now.

RAYERN SUBURBS

Ray ZAIG now has a rotary dipole on 20 mx. which was a rotary dipole on 20 mx. with this lone element, it won't be too long before Ray grows either one in front or one arrival in this region 4 or 5 years ago is Ray ZTII, who has been re-introducing Limseld on ZTII, who has been re-introducing Limseld on ZTII, who has been re-introducing Limseld on Limself and the long through th

sourns a sor or miningar our.

Aloc ZABIU has been heard on 2 mx from his and the source of the sour

Secretary and the East is 22AC, Let is putting out a good signal on 2 mx and popts a 3 over 3, cascode converter, etc. The signal strength of 22X here on the seahourd leaves no strength of 23X here on the seahourd leaves no success the seahourd leaves are concerned. In Wentworth Falls, Peter users are concerned. In Wentworth Falls, Peter were the signal of the seahourd was the seahourd by the seahourd was the seahourd by the seahourd was the seahourd when the signal cannot be heard suburbs where his signal cannot be heard

BRIGHT STAR RADIO

46 EASTGATE ST., OAKLEIGH, S.E.12

ALL FREQUENCIES IN STOCK.

ZERO DRIFT CUTS.

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STR. AUST.: C. N. Muller

QLD.: C. A. Pearce & Co.

WEST AUS .: R. D. Benjamin

trongly, even on an indoor dipole. Which dis-boses of the contention by a tv. authority, who anintained that a tv. transmitter at Wentworth Palls would be "too far away from Sydney." Frai—with 200kw. effective radiated power to be the far and anint and the second of the second that the far and the second of the second of

SOUTH WESTERN ZONE

Main news from the zone this month is of course the preliminary meeting held at Albury course the preliminary meeting held at Albury present were SW 4.3 LD AAF 52.8 Members 2EAA, 2PN, Tumut; 2PL, 2CBJ, Assoc. John Smith, Dennis Cleathers, Griffith; 2RS, 2EU, 2JA, 2OJ, 2ANG, 2QD, Albury; 2AJO, Coolamon; XYLS Weedon, Phillips, Dickson, and

Haberecht.

At the meeting with 2AJO in the chair a very good programme of events was arranged for the Convention. Programmes will be sent out to other zones as soon as published. Two lems of interest on the programme are a tour of the Hume Weir and the big catered dinner to be held on the first (Saturday) night of

Henns of interest on the programme are a tour to be held on the first (Saturday) night of the held of the first (Saturday) night of the held of the first (Saturday) night of the held of

NORTH COAST AND TABLELANDS

NORTH COAST AND TABLELANDS
Little news for the zone this month, the hightime for the property of the coast of the coast

VICTORIA

80 METRE TRANSMITTER HUNT 90 MITRE TRANSMITTER HUNT
PArticipants had very pleasant summy weather
Participants had very pleasant summy weather
down the bank of the Yarra River behind the
Herington Ballway Station. This proved to be
the representation of the transmitter of the consistency
one side by the river and Gardiner's Creek, and
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CENTRAL WESTERN ZONE

This month we must welcome two intended members to the W.I.A. They are Keith Semmler, of Murtoa, as a full member, and Howard Wills, of Horsham, as an associate member. Both these chaps are now waiting to be admitted, so we wish you the best of luck chaps. ted, so we wish you the best of luck chaps. Congratulations to Merv 3AFO and Nora on the arrival of a son. Guess Merv will have to let Amsteur Radio take a back seat for a while. Conditions have been very spasmodic in these parts of late so have not been spending much time on the air, however will have to get busy from now on as Convention time is around again.

EASTERN ZONE

Confine EASTERN ZONE

Confine State of the Confine The radio club now carrying the title of East Gippsland Radio Society is still going strong and is meeting next at 3AHK's place on 19th August. Last meeting was at Alan Jacka's where a good programme of educational films

NORTH EASTERN ZONE

All the time of writing it has not been posall the time of writing that an other postions are the state of the state o

The State of the State of the see seen or to be time, but Alice With his to be seen the seen of the se

SOUTH WESTERN ZONE

Activity this month has been fairly quiet as the calculust of the month has been fairly quiet as the equipment that they got out of the last pieces and from what can be ascertained that they got out of the last pieces and from what can be ascertained that they got out of the last pieces where the second in the case of the second as power to be a second as power as the progress up a bit. Bill Wines scored and the progress up a bit. Bill Wines scored and the progress up a bit. Bill Wines scored and the progress up a bit. Bill Wines scored and the progress up a bit. All the boys at this end of the sone are very lucky in having such a good brother Amateur se John 3AGO who took his ear to town too se John 3AGO who took his ear to town too John. Thunks chaps for this effort. Cee 3XW is still giving the s.ab. a fair sort of a doing, I still haven't heard saything from Ballaret interest taken in the usual Sunday morning hook-ups, so come on chaps, rattle your bones. AARC was beend on the band for the first time. Harry 3XI still hunts up the 20 mx

BALLARAT AND DISTRICT RADIO SOCIETY BALLART AND DISTRUT RADIO SOCIETY
The monthly meeting was held on 3/47.55 at
the YM.C.A. The attendance was the normal
state of the sta

certain amount of custion and respect.

Any inference in last months robus about Any inference in last months robus about crimes, and the control of the con

GEELONG AMATEUR RADIO CLUB

THE COUNTY AND THE CALL OF THE COUNTY AND THE CALL OF THE CALL OF

QUEENSLAND TOWNSVILLE

A meeting of the Townstein Ends (this was held at the residence of #IX on 2015 Auna and held at the residence of #IX on 2015 Auna and held at the residence of #IX on 2015 Auna and held at the residence of #IX on 2015 Auna and held at the Chairman welcomed two prospective associate members and usual business good run through members and usual business good run through a company of the property of

those Interested to contact the Secretary. A very interesting feature on Bhombe Antenna A very interesting feature on Bhombe Antenna vided diagrams, etc. He related his experiences with concernment conducted by the powers that the contract of the contract of the power that the contract of the contract





WRITE OR CALL AT-

Portable Transceivers, Remote Control and Television were made practicable by the precision manufacture of reliable miniature V.H.F. component parts.

If you're planning to build V.H.F. equipment, remember you can depend upon Gerard and Goodman who have the biggest fange of stock components carrying the better known brand names.

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KT46, etc.

See "Radio and Hobbics" of Feb-

* TYPE 921 (921-8: 2 or 8 ohms; 921-15: 3.7 or 15 ohms) * TYPE 931 (931-8: 2 or 8 ohms; 931-15: 3.7 or 15 ohms) 20 WATTS: 30-30,000 c.p.s.

For VALVES:

For VALVES: 807, KT66s. --Sultable Conversion

0.p.s. "WILLIAMSON" to U.L. Leakage Inductance: See "Audio Engineering" of June,

Primary: 6,600 ohms. SCREEN TAPS: 19% of Plate Z. F.R.: Plus or minus 1 db 10-60,000 14P/34P: 18 mH. maximum.

ruary, 1955, 17 watte U.L. Amplifier. Prim./Sec.: 20 mH. maximum.

20 WATTS: 20-30,000 c.p.s. Primary: 4,500 ohms.

SCREEN TAPS: 19% of Plate Z. F.R.: Plus or minus 1 db 10-60,010 Leakage Inductance:

14P/14P: 15 mH. maximum Prim./Sec.; 15 mH. maximum

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Page 22 Amateur Radio, September, 1955 thrilled with his new shortened beam and try-ing to get some almost impossible front to back ratio. Alan 4BE often on giving Rex modula-tion checks. Ed 4WH still beasting how his ZL Special performs. Joe 4JH heard recently first time for many months. No others being heard on the band.—4RW.

ROCKHAMPTON

At the July medical of the branch. Let 401
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MARTHOROUGH

41 and 4ED vest on DX-position is one
between the properties of the pro

GYMPIE

4LN is on 80 mx early evenings. Barry is re-building a TA12 tx and he and 4XR are get-ting some simple (they hope) gear ready for 288 Mc. 4CR surprised the locals by coming up on 40 mx after years of silence. Let's hear more of you Co!!

SOUTH AUSTRALIA

treal Industries, for making the night possible. Noticed Roy SAC at the meeting enjoying the lecture. Anybody with a call sligh like that is 700-850 call by the control of the control of

time I was at a loss to think just who it could be from. However, I eventually woke up that it was from no other than the multi-millionaire from VKS who has been holidaying in VK4. He

From Very Co. and the form the small-surface are proposed to be bring a very good time almough in Languages. The language is the language in the language is the language in L

me to have an attack of the vapours.

Nobby SGV has been successfully to reading the Nobby SGV has been successfully to reading the results. Unfortunately this means that he has to there for American Robot or the means of the Robot of the

WOOMERA RADIO CLUB

At this spores, in print the three club will have passed its third birthday and act up a large state of the control of the con

referred at the energy of the North March and the Control of the C

for his holby, let alone for an executive position and time that Reg has part into this part into the part into th

SOUTH EAST AREAS

SOUTH RAST AREAS

To monthly meeting of the S.R. boys was been as the control of the S.R. boys was been as the control of the S.R. boys was been as the control of the cont service.

5KU active both on 40 and 20 mx and believe

selection with the depth of the and bluers and believe that they have been extra growing the new consistent which is a selection of the select

this most, but the exhibitions in still there with depend with depend the star for the law of the warm with depend the star for the law of the warm with depend the star for the law of the warm with depending the star for the law of the warm with the law of the law

of the noise Doc. let me shoot at him unmertically, and came back for more without of battle that always took place was to real at times, that even my best friends were taking don't hold that "Pamys" against me, it was all part of the act, although at times even I had to give my successor, Jake XDD, all the help you can fellows, he is a good scout, even if he does not always agree with me!

TASMANIA

The general meeting for August was held at the usual spot, with TBJ presiding, in the absence of TF. Despite a most wintry night, there was a good roll-up of members, and Mark Hurburgh's lecture on "Infra Red Hays and their Detection" was greatly appreciated by all. The lecture was tape recorded by Barney

More in high parties because on "there food with a coning of the level was these recorded by Barney
Len Tilz sevines that the Notes Investigation
and the level was the preceded by Barney
Len Tilz sevines that the Notes Investigation
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stille in the 7 Mc. band, and it is heped that seed that the control of the contr

must abide by what is laid down in this matter. And now to close with a few short random joitings. The was prevented from attending a the family. Moo-ow of a trick to have piazed on you Alan. Associate Vance Tobrana still to get that titled vance. Take a to get that the piaze of the piaze o

NORTHERN ZONE

When this leave has been distributed, our old when this leave has been distributed, our old collection of the state of the

Finders Island.

A couple of Sundays ago we worked the official TWI station in Hobert. Nice to hear you Tom, even if you do use the TEFD still, we always lister for you when at home. Saw at the property of the still of the sti

NORTH WESTERN ZONE Amateur operations of the zone have been quiet the last couple of months with periodic openings in the DX bands and some good re-

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LIMITED LICENSE

Light "A.R.," Dear Sir.

"Dear Sir.

of a tubed of cirry lines being washed in Abary 2018 ago, a single controvery in the Abary 2018 ago, a single controvery in the control of th

As I see this dispute, if resolves into two clear cut issued as Whether limited licensess should be described to the control of the P.M.G. Department they are qualify for the full A.O.C.P.; or (b) Whether they should be given a clear green light with full membership irrespective of their qualifications.

I, unlike other correspondents, do not wish to take sides. I, like them, have not the full facts. Even now after three months of this literary battle, I can see all kinds of side issues being brought into the controversy which I feel cannot go without some observations. I feel cannot go without some observations. VMSOR's big boost for experimenters holding them, as he infers through his writing, to be a support of the supp

amounts to excitly all today that's not already. The correspondent (VKGOR), brush, his remarks "The most valuable bands for the time hards." The most valuable bands for the time hards and the second of the control of

an Amsteur Radio experimenter.

Anasteur Radio today has two main roles, its
service to the community, as shown so admirservice to the community, as shown so admirstructure of the community of the control of the contraction of the community in the community in the community in return for his
goast hobby. If is to the above two points
through DX that he must devote his time and skill.

-ROTH JONES, VK3BG

ports being gained, mainly on c.w. operation. The chief c.w. operators are TUW and TWA the latter having just completed a new all-ban v.f.o.-exciter combination with an excitation of about 25 watts input. This is being used a a rig until the new final is completed. a rig until the new final is completed.

Associate K. Hancock was seen recently viewing some 1925 vintage autodynes with four r.f.
stages and each stage enclosed in aluminium cases and the seen for the recent seen for the rece

PAPUA-NEW GUINEA

PAPUA—NEW GUINEA
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Amateur Radio, September, 1955 Page 24

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